

REMARKS

Claims 1-33 are pending in the present application. Reconsideration of the claims is respectfully requested.

Amendments were made to the specification to correct errors and to clarify the specification. No new matter has been added by any of the amendments to the specification. Also, a Replacement Sheet for Figure 1 has been included.

I. 35 U.S.C. § 102, Anticipation, Claims 1-6, 8-17, and 19-22

The Examiner has rejected claims 1-6, 8-17, and 19-22 under 35 U.S.C. § 102 as being anticipated by Kikinis et al. (U.S. Patent No. 5,964,848); hereinafter *Kikinis*. This rejection is respectfully traversed.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 **only if every element of a claimed invention is identically shown in that single reference**, arranged as they are in the claims. (emphasis added) (*In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990)). All limitations of the claimed invention must be considered when determining patentability. (*In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994)). *Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches*. (emphasis added) (*Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983)). *Kikinis* does not identically teach or suggest each and every element of claims 1-6, 8-17, and 19-22.

A. Independent claim 1 of the present invention, which is representative of independent claims 12 and 23, reads as follows:

1. A method of managing copies of virtual volume data, comprising:
receiving an access request directed to an original virtual volume;
mapping the access request to a secondary virtual volume; and
performing the access request on one or more physical volumes
associated with the secondary virtual volume.

With regard to claim 1, the Examiner stated:

As per remark, Applicant's counsel contended that (a) "The cited reference does not teach the claimed limitations of receiving an access

request directed to an original virtual volume; mapping the access request to a secondary virtual volume as claimed in claim 1” (page 9, first paragraph);....

With respect to (a) first of all, Examiner would like to emphasize that receiving access request directed to an original volume is taught as EIDE adapter which receives access request direct to the primary device 519 (column 4, lines 60 et seq.); noting that the controller firmware is the translating protocol which allows mapping of the access requests to multiple secondary IDE devices, for example, Kikinis clearly disclose that each of the secondary IDE device having an EIDE microcontroller and firmware to translate between the EIDE protocol and the protocol of the particular device (e.g. see column 5, lines 19 et seq.); mapping process is part of the translating protocol which is inherently taught by Kikinis....

(*Office Action*, dated July 13, 2004, pages 8 and 9).

Kikinis does not identically teach or suggest every element of the Applicants’ current invention as recited in claim 1. Rather, *Kikinis* teaches, “[a]n IDE interface **communicates with peripheral devices not conforming** to ST506 specification by providing firmware to microcontrollers mounted on the non-conforming peripheral devices to translate between the data structure of an ST506 specification device and the data structure of the non-conforming device.” (emphasis added) (*Kikinis*, Abstract). “In the preferred mode for this embodiment, one primary device and eight secondary devices can be connected to the EIDE adapter and individually addressed by the CPU.” (*Id.*, column 5, lines 3-5). “The EIDE firmware monitors the computer bus for a request to communicate with a secondary device. If no request is forthcoming, communication with the primary device is maintained. If (and when) there is a request on the bus for communication with a secondary device, including data to identify the particular device, the EIDE sends a command on the peripheral connection cable to deactivate the primary and enable the secondary devices.” (*Id.*, lines 58-67). Consequently, *Kikinis* merely teaches a method for communicating with and switching between non-conforming secondary devices.

In contrast, claim 1 of the present invention recites a **method to manage copies of virtual volume data** by receiving an access request directed to an original virtual volume, mapping the access request to a secondary virtual volume, and performing the

access request on one or more physical volumes associated with the secondary virtual volume. Therefore, the current invention as recited in claim 1 is for managing copies of virtual volume data and not for managing peripheral devices that do not conform to a ST506 in a data processing system as taught in *Kikinis*. In addition, the method recited in claim 1 of the present invention provides an additional layer of functionality by mapping the original virtual volume to a secondary virtual volume to access one or more physical volumes associated with the secondary virtual volume. In other words, there are two layers of requests (original and secondary virtual volumes) before accessing the physical volumes. By way of example:

[t]he present invention alleviates the burden on the host machines for performing complex volume management by inserting an additional layer of functionality between the host machine applications and the data storage library. This additional layer of functionality provides volume translation so that an input/output (I/O) request to a virtual volume may have the I/O request redirected to a different set of physical volumes in the event that an original set of physical volumes is unavailable, without requiring the host machine's applications to direct the I/O request to this different set of physical volumes. In other words, the host machine's applications may still direct I/O requests to the same virtual volume regardless of whether the original set of physical volumes are being accessed or a different set of physical volumes are being accessed due to a failure. Thus, the actual physical volumes being accessed are transparent to the host machine's applications.

(*Application*, page 11, line 22 – page 12, line 9).

Kikinis does not teach the additional layer of functionality as recited in claim 1 of the Applicants' current invention. Examiner Thai stated that the EIDE adapter receives an access request direct to the primary device and that the controller firmware is the translating protocol which allows mapping of the access requests to multiple secondary IDE devices. (*Office Action*, page 8). This is demonstrative of the fact that in *Kikinis* there is only one functional layer between the primary and secondary devices and that *Kikinis* does not teach the additional layer of functionality of mapping the original virtual volume to a secondary virtual volume to access one or more physical volumes associated with the secondary virtual volume as recited in claim 1 of the current invention. Moreover, there is nothing in *Kikinis* that teaches or suggests an additional intermediate

layer between the primary device and the non-conforming secondary devices. Furthermore, Applicants respectfully submit that the primary and secondary devices referred to in *Kikinis* are analogous to the “one or more physical volumes” recited in claim 1 of the present invention, as opposed to the original and secondary virtual volumes proposed by Examiner Thai.

As a result, *Kikinis* does not identically teach or suggest each and every element of the Applicants’ invention recited in claim 1.

B. With regard to independent claim 23, the Examiner stated:

As per claims 23-33, *Kikinis* discloses the invention as claimed, detailed above with respect to claims 1-11 and 12-22; ***Kikinis* however does not particularly disclose a computer-readable medium of instructions to be implemented on a computer** as being claimed in claims 23-33.

(*Office Action*, page 7).

Applicants agree with Examiner Thai that *Kikinis* does not teach or suggest the computer program product as recited in claims 23-33 of the current invention, which is further evidence that each and every element of the recited claims in Applicants’ current invention is not identically taught or suggested in the *Kikinis* reference.

C. In view of the above arguments, Applicants submit that **each and every element** of independent claims 1, 12, and 23 **are not identically taught or suggested by *Kikinis***. Claims 2-11, 13-22, and 24-33 are dependent claims depending on independent claims 1, 12, and 23 respectively. Applicants have already demonstrated claims 1, 12, and 23 to be in condition for allowance. Applicants respectfully submit that claims 2-11, 13-22, and 24-33 are also allowable, at least by virtue of their dependence on allowable claims.

II. 35 U.S.C. § 103, Obviousness, Claims 7, 18, and 23-33

The examiner has rejected claims 7, 18, and 23-33 under 35 U.S.C. § 103 as being unpatentable over *Kikinis et al.* (U.S. Patent No. 5,964,848). This rejection is respectfully traversed.

The Examiner bears the burden of establishing a *prima facie* case of obviousness based on the prior art when rejecting claims under 35 U.S.C. § 103. (*In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992)). For an invention to be *prima facie* obvious, **the prior art must teach or suggest all claim limitations.** (emphasis added) (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)). *Kikinis* does not teach or suggest redirecting an access request in response to a fault as recited in method claim 7, apparatus claim 18, and computer program product claim 29 of Applicants' current invention.

A. With regard to claims 7 and 18 the Examiner stated:

As per claims 7 and 18, *Kikinis* discloses the invention as claimed, detailed above with respect to claims 1 and 12. ***Kikinis*, however, does not particularly disclose the redirecting of access request in response to a fault** in a physical volume of the first secondary virtual volume. (emphasis added).

(*Office Action*, page 6).

Dependent claim 7 of the present invention, which is representative of dependent claims 18 and 29, reads as follows:

7. The method of claim 6, wherein the access request is redirected in response to a fault in a physical volume of the first secondary virtual volume.

In contrast, *Kikinis* teaches:

At Power-on or Reset ... the primary IDE device enters the active state and all secondary devices enter the idle state. When the CPU issues the IDE command to select the secondary device the primary device enters the idle state according to standard IDE protocol. In a departure from standard IDE protocol, all EIDE secondary device controllers remain in the idle state. The next IDE command, called in the invention Unit Select, is a command not defined in the conventional IDE protocol, and causes the EIDE controllers to compare the transmitted Unit Select data value with the device unit number. **The device having a matching unit number enters the active state. All other secondary controllers remain in idle, or inactive state.** The activated device will thereafter

respond to IDE commands in accordance with standard protocols.
(emphasis added).

(*Kikinis*, column 5, lines 30-45).

The excerpt above, which is exemplary of the *Kikinis* invention, does not teach or suggest that communication between the primary device and the selected non-conforming secondary device will be redirected to a second non-conforming secondary device in the event of a fault found in the originally selected non-conforming secondary device. Instead, *Kikinis* teaches that all other non-conforming secondary devices that do not have a matching device unit number **will remain in an inactive state**. (emphasis added) (*Id.*). In other words, no other secondary device will be active, or become active, other than the one selected with the matching unit number.

In addition, there is no reference in *Kikinis* for switching to an alternate non-conforming secondary device if the initially selected one is not working or if the information contained in it is corrupted. Moreover, Applicants agree with Examiner Thai that *Kikinis* does not disclose the redirecting of access requests in response to a fault. (*Office Action*, page 6). Accordingly, *Kikinis* does not teach or suggest redirecting an access request in response to a fault as recited in claim 7 of Applicants' current invention.

All limitations of the claimed invention must be considered when determining patentability. (*In re Lowry*, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031,1034 (Fed. Cir. 1994)). In comparing *Kikinis* to the claimed invention to determine obviousness, limitations of the presently claimed invention may not be ignored. The present invention in claim 7 recites redirecting an access request in response to a fault. Such a feature is not taught or suggested in *Kikinis*. Therefore, claim 7, which is representative of claims 18 and 29, is not obvious in view of *Kikinis*.

B. With regard to claims 23-33, the Examiner stated:

As per claims 23-33, *Kikinis* discloses the invention as claimed, detailed above with respect to claims 1-11 and 12-22; ***Kikinis* however does not particularly disclose a computer-readable medium of instructions to be implemented on a computer** as being claimed in claims 23-33. However, one of ordinary skill in the art would have recognized that computer readable medium (i.e., floppy, cd-rom, etc.) carrying computer-executable instructions for implementing a method,

because it would facilitate the transporting and installing of the method on other systems, is generally well-known in the art.... The examiner takes Official Notice of this teaching. Therefore, it would have been obvious to put Kikinis's program on a computer readable medium, because it would facilitate the transporting, installing and implementing of Kikinis's program on other systems. (emphasis added).

(*Office Action*, pages 7 and 8).

Claims 23-33 are the computer program product for method claims 1-11 and apparatus claims 12-22. Applicants agree with Examiner Thai that *Kikinis* "does not particularly disclose" the computer program product as recited in claims 23-33 of the current invention. (*Id.*). But, Examiner Thai further stated that one of ordinary skill in the art would have recognized that computer readable medium carrying computer-executable instructions for implementing a method is generally well-known in the art. (*Id.*). The mere fact that a process or device utilizes a known scientific principle does not make that process or device obvious. (*In re Van De Vondervoort*, 77 F.3d 422, 425, 37 U.S.P.Q.2d 1663, ___ (Fed. Cir. 1995)). In other words, just because the Applicants' current invention employs a known principle, it does not render the whole invention as obvious. Certainly, the present invention uses a computer program product in order for it to function as recited in the claims. However, the use of a computer program product does not automatically make claims 23-33 obvious.

Moreover, independent claim 23 of the present invention, which is representative of independent claims 1 and 12, is not taught or suggested by *Kikinis*. (see Section I argument). Consequently, Applicants respectfully submit that claims 24-33 are also allowable, at least by virtue of their dependence on allowable independent claim 23. In addition, as previously stated above, dependent claim 29 includes features not taught or suggested by *Kikinis*.

In view of the above arguments, *Kikinis* does not teach or suggest Applicants' present invention as recited in claims 7, 18, and 23-33.

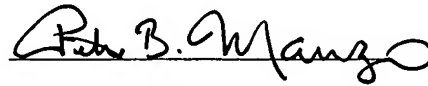
III. Conclusion

It is respectfully urged that the subject application is patentable over the cited reference and is now in condition for allowance.

The examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

DATE: 11-12-04

Respectfully submitted,



Peter B. Manzo
Reg. No. 54,700
Yee & Associates, P.C.
P.O. Box 802333
Dallas, TX 75380
(972) 385-8777
Attorney for Applicants

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